Superfund Records Center SITE: PICITO
BREAK: 8.3
OTHER: 45132

# Five-Year Review Report

Third Five-Year Review Report for The Picillo Farm Superfund Site Town of Coventry Kent County, Rhode Island

July 2003

Prepared by:
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Region 1, New England
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Approved by:

Date:

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#### **Executive Summary**

EPA Region 1, New England has conducted the third five-year review for the Picillo Farm Superfund Site in Coventry, Rhode Island (the Site). The methods, findings, and conclusions of this review are documented in this five-year review report. The purpose of the five-year review is to determine whether the remedies at the Picillo Farm Superfund Site are protective of human health and the environment. This is the third five-year review for this Site and focuses on remedial design and implementation associated with Operable Unit 2 (OU2). Work associated with Operable Unit 1 (OU1) was completed prior to the second five-year review.

OU1 involved the excavation and off-Site disposal of stockpiled soil that was completed in 1989. Residual PCB-impacted surficial soil associated with these stockpiles was removed by EPA as part of OU2 in 1998. Based upon these actions, the remedy for OU1 is expected to be or is protective of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU2 protects human health in the short-term through implementation of various response actions, the partial placement of Institutional Controls, and the physical control of Site access. The 1993 ROD determined that the response actions that are in the process of being implemented would be protective in the long term to human health and the environment. The remedy at OU2 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

#### **Five-Year Review Summary Form**

SIT	日巾	ENT	ПЭ	CAT	ON

Site name (from WasteLAN): Picillo Farm EPA ID (from WasteLAN): RID980579056

Region: 01 State: RI City/County: Coventry/Kent

SITE STATUS

NPL status: Final

Remediation status (choose all that apply): OU 1 Complete

OU 2 Operating

Multiple OUs?\* YES | Construction completion date: Planned for September 2003

Has site been put into reuse? NO

**REVIEW STATUS** 

Lead agency: EPA, Region 1 – New England

Author name: Anna F. Krasko

Author title: Remedial Project Manager

Author affiliation: U.S. EPA, Region 1- New

England

Review period: March - July 2003

Date(s) of site inspection: 5 / 12 / 2003

Type of review: Post-SARA
Review number: 3 (third)

**Triggering action:** Signature date on previous Five-Year Review Report

Triggering action date (from WasteLAN): 05/22/98

Due date (five years after triggering action date): 05/22/03

#### Five-Year Review Summary Form, cont'd.

#### Issues:

Ability to achieve target dewatering elevations in the Northeast and Northwest Trench areas

Ability to place all required Institutional Controls

Confirming that SVE air treatment system is meeting discharge requirements

Confirming that corrective actions taken to address groundwater mounding due to SVE are effective

Confirming that MOM hydraulic containment is achievable

Increased concentrations of contaminants of concerns observed in the northwest portion of the fringes of the plume

#### **Recommendations and Follow-up Actions:**

Evaluate ability to consistently meet dewatering levels, including installation of additional well(s)

If requested, EPA may facilitate placement of final Institutional Controls

Review air emissions data to confirm requirements are being met, if not met then implement corrective action

Continue to implement passive and active air injection in most problematic areas, evaluate SVE performance

Evaluate flow conditions using flow nets, modify operations if necessary

Collect additional data to assess the increasing concentration trends observed at a portion of the Northwest Plume. Evaluate impact of the operation of nearby pumping wells on the hydraulics in the vicinity of these wells and affect on the concentration trends in this area; modify operations if necessary

#### **Protectiveness Statement(s):**

OU1 involved the excavation and off-Site disposal of stockpiled soil that was completed in 1989. Residual PCB impacted surficial soil associated with these stockpiles was removed by EPA as part of OU2 in 1998. Based upon these actions, the remedy for OU1 is expected to be or is protective of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU2 protects human health in the short-term through implementation of various response actions, the partial placement of Institutional Controls, and the physical control of Site access. The 1993 ROD determined that the response actions that are in the process of being implemented would be protective in the long term to human health and the environment. The remedy at OU2 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

#### **Other Comments:**

None

#### Picillo Farm Superfund Site Coventry, Rhode Island Third Five Year Review Report

#### 1.0 INTRODUCTION

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five year review reports. In addition, five year review reports identify deficiencies found during the review, if any, and identifies recommendations to address them.

The Agency is preparing this Five-Year Review pursuant to CERCLA Section 121 and the National Contingency Plan (NCP). CERCLA Section 121 states:

If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented.

The Agency interpreted this requirement further in the NCP; 40 CFR Section 300.430(f)(4)(ii) states:

If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after the initiation of the selected remedial action.

EPA Region 1 conducted this statutory five year review of the remedial actions implemented at the Picillo Farm Superfund Site in Coventry, Rhode Island (the Site) in accordance with OSWER Directives 9355.7-03B-P, "Comprehensive Five-Year Review Guidance" (June 2001). ESS Group, the contractor for the Potentially Responsible Parties, provided analysis in support of this five year review.

This is the third five-year review conducted for the Site. The triggering action for this review is the completion of the previous five-year review on May 22, 1998 and the fact that the remedial action in OU2 requires five or more years to complete and wastes and contaminated ground water and surface water are still present at the Site that prevent unlimited use and unrestricted exposure.

#### 2.0 SITE CHRONOLOGY

Table 1 presents a chronology of significant events for the Picillo Farm Superfund Site.

## Table 1 Site Chronology

Date	Event
Prior to late '70s 1977	Pig farm and private residences occupied the Site.  Waste shipped from other disposal facilities or diverted by waste haulers to Picillo Pig Farm over the course of several months was disposed of illegally into open, unlined trenches.
September 1977	Sodium aluminum hydride disposed of at the Site reacted and caused a large explosion and fire, which brought the Site to the attention of the Town of Coventry, RIDEM and EPA.
1980-1982	Early EPA and RIDEM removal actions: over 10,000 drums removed; 6 former disposal trenches excavated; some soil disposed of off-Site; approximately 6,500 cubic yards of soil stockpiled on-Site – 2 piles of Phenol-contaminated soil and 1 pile of PCB-contaminated soil.
1980-1983	First round of fund-lead investigation of groundwater, surface water and soil – first RI/FS.
October 23, 1981	EPA proposed Site for the NPL.
September 8, 1983	Site was listed on the NPL.
September 30, 1985	EPA issued ROD calling for disposal of the approximately 6,500 cubic yards of stockpiled contaminated soil in an on-Site RCRA landfill. (Operable Unit (OU) 1)
March 3, 1987	EPA issued an amended ROD stipulating off-Site disposal of the stockpiled contaminated soil and requiring a second RI/FS to determine the nature and extent of residual contamination and to evaluate groundwater cleanup alternatives.
April 14, 1988	EPA and RIDEM entered into a Consent Decree with four PRPs to implement the 1987 amended ROD: removal and off-Site disposal of the stockpiled soil and Site closure tasks.
February 7, 1990	EPA certifies that remedial action work under 1988 Consent Decree completed by PRPs.
1990-1993	EPA performed the second RI/FS.
May 19, 1993	EPA signs first Five Year Review Report.
June 15, 1993	EPA published notice of issuance of FS Report and Proposed Remedial Action Plan for OU 2.
September 27, 1993	EPA issued second ROD requiring SVE of Source Area; groundwater treatment and extraction; and institutional controls.
November 28, 1995	EPA and RIDEM entered into a Consent Decree with a group of PRPs, five of which agreed to implement the 1993 ROD.
January 1996	PRP Group submits Draft Remedial Design Work Plan and Project Operations Plan along with preliminary remedial design for remedial action.
September 1997	PRP Group submits Draft 30 Percent Design for remedial action. Documents SVE pilot test.
March 1998	PRP Group submits Draft 60 Percent Design for remedial action
May 22, 1998	EPA signs second Five Year Review Report
October 1998	PRP Group completes 100 Percent Design for remedial action.
Fall 1998	EPA excavated and removed shallow soils in vicinity of former PCB pile.
January 18, 1999 – January 17, 2000	PRP Group implements 100 Percent Design by constructing the Management of Migration (MOM) Remedy (hydraulic control) and the Source Area Remedy
August 1999	(dewatering and SVE) and the associated groundwater and air treatment systems. PRP Group discovered epoxy waste and grossly contaminated soil during SVE pipe trench excavation in the Northwest trench area.

February 2000 to April 2001 March 2000	PRP Group completed a series of remediation system performance tests in preparation for full-scale system operation. PRP Group submitted draft Construction Completion Report.
March 2000	PRP Group submits Institutional Controls Plan and EPA approves. PRP Group continues implementing institutional controls.
March 2001 – August	PRP Group commences with full-scale groundwater extraction and treatment
2001	system operation. Source control dewatering and MOM remedy commence.  Implemented a series of tests and groundwater treatment system modifications to
	achieve Al and Zn surface-water-discharge criteria.
November 2001	PRP Group commenced source control SVE operation.
September 25, 2002	EPA issues Action Memorandum for the epoxy waste Removal Action. Starts
	formal process for CERCLA Response Action for excavation and removal of
	Picillo Waste from portion of Northwest Trench. PRPs will be partially
	reimbursed for the work by the EPA after filing a Claim for CERCLA Response Action in accordance with 40 CFR Part 307.30.
December 5, 2002	EPA issues Administrative Order on Consent for Picillo Waste Removal Action.  PRPs start preparing workplans for Picillo Waste removal.
March 12, 2003	PRPs submit Draft Final Work Plan for the Picillo Waste Removal Action.

#### 3.0 BACKGROUND

May 2003-July 2003

This section describes the fundamental aspects of the Site to assist in identifying the threat posed to the public and the environment at the time of ROD.

PRP Group implements the Removal Action.

#### 3.1 Physical Characteristics and Land Use

The Site is located at 210 Piggy Lane in Coventry, Rhode Island near the intersection of State Highway 102 and Perry Hill Road (Figure 1). Located on a former pig farm, the Site includes a 10-acre disposal area, which is currently fenced, and approximately 35 acres of surrounding woodland and wetland areas, defined by the extent of the groundwater and surface water impacts. Land surrounding the Site is rural and consists of mixed woods and wetlands. Residential properties are located north, northeast, and east of the Site, along Perry Hill and West Log Bridge Roads. All nearby residences are served by private wells and the testing of these drinking water wells found no Site-related contamination to date. To the west, southwest, and south of the Site is a mix of wetlands and wooded areas.

#### 3.2 History of Impacts

During a limited period in 1977, at least 10,000 drums of hazardous substances plus an undetermined volume of liquid chemical waste and solid waste were illegally disposed of into several unlined trenches at the Site. Wastes disposed of at the Site included industrial solvents, oils, pesticides, PCBs, paint sludges, resins, still bottoms, and other hazardous materials.

#### 3.3 Initial Response

Impacts at the Site was discovered after a sodium aluminum hydride explosion and fire at the Site in September 1977 brought the dumping activities to the attention of regulatory agencies. This led to a number of investigations and remedial activities at the Site. The State of Rhode Island and EPA shared

responsibilities in joint cleanup activities and supervision. Between 1980 and 1982, the trenches located along the perimeter of a cleared field – the northeast trench, northwest trench, west trench, south trench, and two slit trenches – were excavated, approximately 10,000 drums and a significant amount of contaminated soils were removed and disposed off-Site (Figure 2). Approximately 6,500 cubic yards of PCB- and phenol-contaminated soil were stockpiled on Site.

On September 30, 1985, after conducting an RI/FS, EPA issued a Record of Decision (ROD) for Operable Unit 1 (OU 1) which called for disposal of the stockpiled contaminated soil in an on-Site RCRA landfill. The State of Rhode Island contested the ROD, and in 1987, following the enactment of the Superfund Amendments and Reauthorization Act (SARA), EPA issued an amended ROD. The amended March 3, 1987, ROD required that the contaminated soils be disposed off Site in a RCRA/TSCA landfill, and Site closure activities be implemented. The stockpiled soils were removed in 1988 by the Potentially Responsible Parties.

The 1987 amended ROD stated that the recommended remedy would not eliminate the residual groundwater contamination at the Site and required the EPA to conduct a remedial investigation/feasibility study (RI/FS) to determine the nature and extent of the contamination and to evaluate cleanup alternatives. The EPA initiated RI/FS activities in 1988. Upon RI/FS completion, the EPA issued a ROD for OU 2 on September 27, 1993.

#### 3.4 Summary of Basis for Taking Action

Investigations by RIDEM and EPA determined that impacted groundwater was discharging to a wetland approximately 1,200 feet northwest of the former Disposal Area, and that the groundwater and surface waters were impacted by various halogenated and aromatic VOCs, SVOCs, and metals. On-Site soil was contaminated with SVOCs and VOCs that were found to represent a continuing source for adverse groundwater impacts. Potential threats include use of groundwater and surface water as drinking water supplies. Contaminated surface water and the PCB-contaminated shallow soils also posed ecological risks.

#### 4.0 REMEDIAL ACTIONS

Following initial emergency response actions between 1980 - 1982, remedial actions have been developed and implemented in accordance with the March 3, 1987 amended ROD (OU 1) and September 27, 1993 ROD (OU 2). In addition, a CERCLA Removal Action is currently being implemented under the December 2002 Administrative Order on Consent for excavation and disposal of the recently discovered epoxy waste.

#### 4.1 Operable Unit 1 Remedial Actions

All remedial actions required by the 1987 amended ROD (OU 1) were completed as documented in EPA's February 7, 1990 certification letter. Remedy selection, implementation, and operation and maintenance (O&M) were documented in the two previously prepared Five Year Review Reports. The following summarizes this information.

The 1987 amended ROD required off-Site disposal of approximately 3,500 cubic yards of PCB impacted

soils and 3,000 cubic yards of phenol impacted soils at an appropriate facility. In 1988, under a Consent Decree with EPA and the State, four of the PRPs implemented the remedial action. The PRPs submitted a report certifying project completion in January 1989. EPA approved this report conditioned upon the Site being reseeded during spring 1989 and making improvements to Site drainage structures. These requirements were met by the PRPs as confirmed by a December 19, 1989, EPA and RIDEM Site inspection and documented in an EPA February 7, 1990, certification letter.

Post remedial action O&M involved periodic Site inspections which were initially performed as part of the EPA RI/FS activities in the early 1990s and then continued as part of the PRP lead remedial action. These O&M requirements have since been incorporated into the ongoing O&M performed under the 1993 ROD (OU 2).

#### 4.2 Operable Unit 2 Remedy Selection

In 1988, EPA initiated the groundwater RI/FS. Following its completion, EPA Region 1 signed the ROD for OU 2 on September 27, 1993. The remedy described in the ROD includes treatment of contaminated groundwater and treatment of soil which presents an ongoing source of adverse groundwater impacts. Removal of the drums and impacted soil conducted in the early 1980s reduced the immediate threat to public health from exposure to hazardous waste contained in the drums and disposal trenches. Implementation of the 1987 amended ROD resulted in the removal of the remaining stockpiled soil from these initial activities. These actions reduced the risk to public health from exposure to contaminated soil remaining on-Site.

The 1993 ROD selected a remedy that combined source control and management of migration (MOM) to address remaining in-situ contamination. The ROD also required excavation and off-Site disposal of surface soils impacted with PCBs from the soil stockpiles managed under OU 1. The ROD primary objective was to address the remaining principal threats to human health and the environment posed by residual soil contamination that presents a continuing source for leaching of contaminants to Site groundwater. To meet this objective the selected remedy included construction and operation of enhanced Soil Vapor Extraction (SVE), dewatering and groundwater pump & treat systems, natural attenuation at the fringes of the groundwater plume, institutional controls, long-term environmental monitoring, and removal of PCB impacted surface soil. The specific objectives associated with each of these remedial actions are summarized below.

- Source control reduce VOC and SVOC levels in the soils so that they no longer represent a continuing source for leaching of contaminants to Site groundwater;
- MOM provide hydraulic containment and treatment of groundwater plumes to limit contaminant migration and discharge into surface waters; fringes of the plume (Dilute Plume) are to be monitored for natural attenuation process;
- Institutional controls restrict the use of impacted land, groundwater and surface water for the duration of the remedial action and ensure that off-Site activities do not interfere with the remedial action;
- PCB-impacted surface soil remove residual surface soil contamination;
- Long-term environmental monitoring program evaluate the extent of contamination over time

and demonstrate compliance.

The major components of the source control remedy include:

- In-situ enhanced soil vacuum extraction (SVE) to remove volatile organic compounds and semivolatile organic compounds;
- Dewatering to lower the water table and treatment of the extracted groundwater;
- Thermally treating vapors extracted from the soil;
- Constructing a temporary cap over source area;
- Performing SVE pilot test and other investigations to optimize SVE system design and evaluate SVE enhancements;
- Developing and implementing a soil monitoring program and performance monitoring program to evaluate the effectiveness of the soil vapor extraction system; and
- Maintaining access restriction to the source area via fence construction and maintenance.

The major components of the MOM remedy and long-term monitoring include:

- Extracting and treating contaminated groundwater from the overburden and shallow bedrock aquifers;
- Developing and implementing an environmental monitoring program for ground water, surface water, and sediment to evaluate the extent of contamination over time and to demonstrate compliance; and
- Developing and implementing a monitoring program to evaluate natural attenuation in the fringes of the groundwater plume.

The major institutional control components include:

- Limiting access to areas of active remediation; and
- · Placing environmental land use restrictions.

The PCB soil removal component involves delineation and excavation and off-Site disposal of surface soil contaminated with PCBs.

#### 4.3 Operable Unit 2 Remedy Implementation

In 1995, EPA entered into a Remedial Design and Remedial Action (RD/RA) Consent Decree (Consent Decree) with its associated Statement of Work (SOW) with a number of Potentially Responsible Parties (PRPs) at the Site. The SOW specifies the remedial design requirements and sets the performance standards for the remedial action. Five of the PRPs, American Cyanamid Company (whose obligations are being performed by Wyeth), Ashland, Inc. (for Ashland Chemical Company), ISP Environmental Services, Inc. (for GAF Corporation), General Electric Company, and Solutia Inc. for Monsanto Company (now Pharmacia Corporation a wholly-owned subsidiary of Pfizer Inc.), agreed to perform the

RD/RA, as set forth in the ROD, the Consent Decree and its associated SOW. The five parties are defined in the Consent Decree as the Performing Settling Defendants and are referred to herein as the PRPs.

With the October 1995 integrity testing of existing monitoring wells the PRPs initiated design investigations. The PRPs submitted the Draft Remedial Design Work Plan and Project Operations Plan (GeoTrans, January 10, 1996) detailing extensive pre-design investigations, an SVE pilot test, and SVE thermal enhancement bench scale study activities. The PRPs initiated field activities with the collection of the first round of quarterly groundwater data in February 1996. Information from these investigations was used during the preparation of the Draft 30 Percent Design Report (HSI GeoTrans, September 16, 1997). Design refinements proposed in the Draft 30 Percent Design Report included discharging treated groundwater to the Unnamed Swamp surface water body and not incorporating thermal enhancement into the SVE system design.

Based on additional engineering evaluations and Agencies' comments, the Draft 60 Percent Design Report (Envirogen, March 2, 1998) included a modification to use 2 ppm (instead of 1 ppm) total VOCs specified in the SOW as a basis for the source control implementation areas and specifying that select SVE and/or dual phase extraction wells be constructed using stainless steel to facilitate future thermally enhanced SVE, if so required.

The Final 100 Percent Design Report (Envirogen, October 5, 1998) presented the final design, drawings, and technical specifications for constructing the source control remedy and MOM remedy. This included development of an Investigatory Boring Program and Construction Stage Testing Program to provide additional information to refine the source area remedy implementation area and to establish source area target dewatering elevations. The Investigatory Boring Program was completed prior to construction and was used to refine the Final 100 Percent Design. In addition, EPA's Office of Research and Development (NRMP, Ada, OK) in collaboration with EPA Region 1, installed a number of monitoring wells and collected soil data to facilitate implementation of the remedy.

On January 13, 1999, EPA Region 1 issued an Administrative Order for Property Access to one of the affected property owners; other required access was obtained by the PRPs through the execution of access agreements. Following securing of access, remedial construction in accordance with the Final 100 Percent Design Report and Revised Draft Remedial Action Work Plan (Envirogen, January 18, 1998) began January 18, 1999, and was completed January 17, 2000. Construction activities are documented in the Construction Completion Report (Envirogen, March 2000). Construction activities included the installation of 95 SVE wells, 37 dual phase extraction wells, and 4 MOM wells to collect soil vapors and groundwater. The bedrock SVE wells proposed in the Final 100 Percent Design Report were not installed based upon the results of the Construction Stage Testing program. A treatment system for soil vapor and groundwater was constructed within an enclosed treatment building.

The groundwater treatment system includes:

- Pre-treatment system to remove metals and suspended solids;
- Ultraviolet oxidation (UV/OX) unit to remove VOCs;
- Carbon to remove residual peroxide from the UV/OX unit;
- Air stripping unit; and

Sludge management system.

The SVE vapor treatment system includes:

- Liquid/vapor separators;
- Catalytic oxidation (Catox) unit for VOC removal;
- Acid-gas scrubber for HCL removal; and
- Brine management system.

Initial mechanical shakedown of the treatment system was successfully completed in the winter of 1999 and mechanical performance testing was partially completed by April 2000. Complete system testing was delayed as the system was forced to operate in batch mode while the PRPs attempted to demonstrate compliance with Surface Water Discharge Criteria (SWDC) for treated groundwater. Specifically SWDC for aluminum, zinc, and four SVOCs were not met during initial batch scale testing. To address this issue the PRPs, the EPA, and the RIDEM agreed to extend the startup period to facilitate full-scale system testing. The SVE system would not run during this initial startup period.

The MOM remedy component and groundwater portion of the Source Control remedy commenced continuous operation in March 2001. From March 2001 through August 2001, the PRPs implemented a series of tests and plant modifications to achieve aluminum and zinc surface-water-discharge criteria. Continued weekly monitoring of groundwater treatment system process water has shown the system is meeting all required SWDC, including the four SVOCs that initially did not meet SWDC, with occasional inorganics exceedances. The occurrence of these exceedances has been remedied with further system optimization and maintenance. Significant modification to the 100 Percent Design groundwater treatment system was not required.

The SVE portion of the Source Control remedy commenced continuous operation in November 2001. Monthly process vapor samples collected from the SVE system demonstrate that applicable maximum allowable stack concentrations (MASCs) are being met by the system.

In the summer of 1998, the Army Corps of Engineers performed PCB soil removal in accordance with the 1993 ROD under an Interagency Agreement with the EPA and under a mixed-work agreement provision of the Consent Decree. The objective was to define the extent of the PCB contamination in the surface soil in four known locations of the Site, excavate all contaminated soil above the Site-specific cleanup level of 1.3 parts per million (ppm) based on protection of environmental receptors, and dispose of the contaminated soil off-Site. The excavation and stockpiling of approximately 1,350 cubic yards of soil was completed on September 1, 1998. Following stockpile sampling for characterization, the contaminated soil was transported and disposed of at an off-Site facility in November and December 1998.

The PRPs began developing the Institutional Controls Plan (ICP) in 1996, with the final Draft Institutional Controls Plan submitted to the EPA on March 20, 2000, and approved by the EPA March 30, 2000. The ICP established the institutional control limits for controlling contact with soil, groundwater and surface water. The ICP requires that Environmental Land Use Restrictions (ELURs) be placed on property owned by four private parties. Institutional controls implementation commenced prior to final ICP approval and included expanding the source area fence to include all portions of the source area

remedy, installing fences around MOM wells located outside the source area fence, placing warning/informational signs on the source area fence and adjacent to portions of the surface water bodies covered by institutional controls, and initiating negotiations with all four property owners to place ELURs on their properties. As of this five year review, ELURs have been placed on two out of four property owner's properties and an agreement in principal has been reached with a third property owner. The EPA has played a significant role in facilitating the placement of ELURs and continued assistance may prove necessary.

#### 4.4 Operable Unit 2 System Operations and Maintenance

The MOM and dewatering portion of the source control remedy commenced full-scale operation March 2001. The SVE portion of the source control remedy commenced full-scale operation November 2001. Operation and maintenance activities at the Site are monitored and reported to the EPA in accordance with the current Operation and Maintenance Plan (Envirogen, May 12, 2000, as revised) and Compliance Monitoring Plan (ESS, March 2002 as revised). Groundwater, process water, surface water, process air, sediments, soil vapors, treatment system residuals (sludge and brine), and soils have all been monitored since system operation commenced. Both physical (e.g. water levels, pressure, vacuums) and chemical monitoring (via both field instruments and laboratory analysis) is performed.

Remedy performance is summarized in Monthly Reports and is detailed in Quarterly Performance Monitoring Reports prepared by the PRPs. Interpretation of system monitoring data and important events at the Site are detailed in Semi-Annual Remedy progress monitoring (SAR) Reports. Groundwater monitoring events are performed semi-annually to monitor trends in groundwater contaminants and are detailed in Semi-Annual Groundwater Monitoring Reports. Also included in these reports are the results of the semi-annual residential well monitoring programs. Select surface water and sediment samples at the Site are collected as required and the results are summarized in Surface Water and Sediment Sampling Reports. Status and effectiveness of institutional controls at the Site are reviewed on a semi-annual basis and are summarized in Semi-Annual Institutional Control Plan (ICP) Status Reports.

Treatment system performance has been reported in Monthly, Quarterly, and Semi-Annual Reports. To date, all applicable Performance Standards have been achieved with the exception of occasional groundwater treatment system inorganic SWDC exceedances. These exceedances are being managed in accordance with applicable State regulations and agreements reached between the PRPs, EPA, and RIDEM.

Starting in 2003, the PRP Group has taken corrective measures to address the impact of the SVE system on water levels and water level measurement readings. These actions have included adjusting the water level measurements techniques to take into account local SVE developed vacuums and reconfiguring the SVE system to allow a passive and active air injection. This will allow for maintenance of current airflow rates through the soil, but at a lower vacuum.

System and Site maintenance is continuously performed in accordance with the O&M Plan. System maintenance includes pump and pipe servicing to maintain flows, tank and piping inspections to identify possible leaks, and treatment system maintenance to ensure performance. Site maintenance includes

grass cutting, snow plowing, road grading, erosion and sediment control device inspections and maintenance, and fence maintenance. In addition the integrity of all system and monitoring well points are inspected at least annually.

The following table summarizes actual PRPs' O&M costs, which exceed ROD estimates. According to the PRPs, the increased costs can be attributed to increased efforts required to achieve inorganic SWDC, number of components in the groundwater treatment train, increased monitoring effort (treatment system and groundwater), level of effort to complete work plans not finalized prior to initiating O&M, level of reporting, and inflation.

Table 2 PRPs' O&M Costs

Dates		Actual Total Costs	Notes
From	То		
March 2001	February 2002	\$3,730,000	SVE operation commenced 11/01
March 2002	February 2003	\$3,210,000	
March 2003	April 2003	\$400,000	

#### 4.5 CERCLA Response Actions

In 1999, during the SVE system piping installation, an area of hazardous material consisting of elongated lumps of white to slightly gray, solid, firm textured material (the "epoxy waste" material), and grossly contaminated soil was uncovered. In order to install the piping, approximately 250 cubic yards of this material was excavated and disposed of at a hazardous waste incinerator. The remaining waste material was left in place and temporarily capped with asphalt.

On September 25, 2002, EPA Region 1 signed an Action Memorandum for removal of the epoxy waste. The Action Memorandum requires the delineation, excavation, sampling, and off-Site disposal of the epoxy material and grossly contaminated soil. Following the Respondents' submittal of a formal application for preauthorization for mixed funding, EPA Region 1 signed an Administrative Order on Consent with the Respondents on December 5, 2002. An Interim Work Plan (ESS) was submitted to the EPA on December 24, 2002. Following initial field testing, the Finalized Work Plan (ESS) was submitted to the EPA on March 12, 2003.

The contractor mobilized May 12, 2003, to commence the waste removal action. The first activity was to disconnect the portion of the source control remedy that would be affected by the excavation. It is expected that excavation will be completed and the portion of the source control remedy taken out of service will be restored by August 2003.

#### 5.0 PROGRESS SINCE LAST FIVE-YEAR REVIEW

The following statement of protectiveness is from the previous five-year review report (May 1998): "...(the) remedies selected for this site remains protective of human health and the environment. The remedy selected in 1993 ROD, which is currently in the design phase, is also protective of human health and the environment."

Previous five-year reviews for the Site, completed in May 1993 and May 1998, recommended a number of actions that were followed-up during this review period. These recommendations along with the follow up activities completed and status are summarized below.

• Implementation of the remedy selected in 1993 ROD under the Consent Decree with the PRPs and an IAG with the COE should be continued: additional extensive delays in the design and implementation of the remedy should be avoided;

All components of the remedy have been designed and implemented as stated in Section 4.2. As stated in Section 4.3, remediation system construction was completed on January 17, 2000. Full implementation of the institutional controls portion of the remedy has been delayed as the PRPs continue settlement negotiations with two property owners. The surficial PCB impacted soils were excavated and removed from the Site in 1998.

Collaboration with EPA's Office of Research and Development (NRMRL, Ada, OK) has been
crucial in negotiating the Consent Decree and design documents at this Site. Continued
technical assistance will be extremely helpful in assuring that the PRPs construction and
implementation of the remedy is technically sound.

NRMRL technical assistance was provided throughout the design process, through source control and MOM construction, and during Compliance Monitoring Plan (CMP) and other plans and submittals prepared by the PRP Group. NRMRL also conducted extensive field studies and data analysis at the Site to aid in design of the remedy.

Monitoring specified in the Consent Decree should continue.

The required monitoring of all media has been performed in accordance with the Operation and Maintenance Plan, Compliance Monitoring Plan, and other workplans prepared and submitted in accordance with the Consent Decree and its associated Scope of Work.

• Institutional Control Plan should be finalized and access restrictions and institutional controls should be implemented as currently planned.

The Institutional Control Plan (Environmental Project Control, March 2000) was approved by the EPA in March 2000. Institutional controls including access restrictions have been placed on two of the five affected properties which are owned by four parties. The PRP Group has been proceeding with negotiations with the remaining two property owners in conjunction with EPA efforts. The PRP Group has reached an agreement in principal with the property owner of two of the remaining properties.

• Periodic site inspections should continue

The Army Corps of Engineers under an Interagency Agreement conducted field oversight during the remedy construction. Representatives from the EPA, COE and RIDEM were regularly on-Site during RD/RA field work and remedy construction. This included weekly Site meetings held during construction between EPA, COE, RIDEM, and PRP representatives. The EPA continued to make regular Site inspections during system start-up and operation. The 5-Year Review Site visit was performed on May 12, 2003.

 Drainage structures, grading and vegetation cover remaining from the 1987 ROD implementation were altered during the SVE pilot test in the summer of 1997 and will be significantly modified as part of implementation of the final remedy. These features should be reviewed as part of the 100 Percent Design.

Soil erosion and sediment control measures were included in the 100 Percent Design (Envirogen, October 1998) reviewed and approved by the EPA. All disturbed areas have been restored with vegetation, remedial system components, drainage structures, or roadways. At least annual monitoring and maintenance, as required, of drainage structures and vegetation is performed in accordance with the O&M Plan.

#### **6.0 FIVE-YEAR REVIEW PROCESS**

This section describes activities performed during the five-year review process and provides a summary of findings when appropriate.

#### **6.1 Administrative Components**

The Picillo Farm Superfund Site five year review was conducted by EPA Region 1 with supporting analysis provided by the ESS Group, Inc., the contractor for the PRPs. Notification of the initiation of drafting the Third Five-Year Review Report is documented in ESS letter to EPA dated March 28, 2003.

#### **6.2 Community Involvement**

Recently the community interest in the Site has been low to moderate. In September 1999, the Roaring Brook Watershed Association, comprised of landowners adjacent to the Site, received EPA's Technical Assistance Grant (TAG) to hire independent technical experts to interpret the data pertinent to the Site. The TAG was closed in 2000, following completion of several reports and two public workshops by the grant recipients.

Approximately 40 residences in a vicinity of the Site participate in the residential well testing program. EPA distributes results of these tests to individual home owners on a yearly basis. The residents are provided with periodic Site updates, including most recent notification on the Removal Action in the Summer 2003. EPA and the State provide information letters to prospective home buyers in the vicinity of the Site and to residents seeking refinancing.

Copies of the Five Year Review are being placed in the information repositories, including the Coventry Public library.

#### **6.3 Site Inspection and Interviews**

The Site inspection was led by Anna Krasko, the EPA Remedial Project Manager (RPM) for the Site on May 12, 2003. Shelley Ducharme, RIDEM Project Manger for the Site assisted in the review as the representative for the support agency. The inspection included observations and review of the

treatment systems, observation of the integrity and wear of the protective caps over the source area northeast, northwest, and west trenches, monitoring well labels and locks, groundwater treatment system outfall, daily operations of the remedial systems, and security and condition of the source area fence line. No problems were observed.

Operation and maintenance of the Site is being reviewed in weekly conference calls between EPA, RIDEM and the PRPs' consultants. In addition, the PRP Group's Project Coordinator and Project Engineer were interviewed during the May 12, 2003 inspection to provide an understanding of the system's performance and operational issues that might require documentation in this five year review report.

#### 6.4 Document Review

Major reports consulted as part of this review are listed in the Reference Section. Monthly, quarterly, and semi-annual reports to assist in evaluating system performance and implementation of institutional controls are reviewed by EPA and RIDEM on a regular basis. Report formats are optimized when necessary to ensure appropriate and relevant information is both documented and reported. No significant issues relating to document and data reporting were discovered during this five-year review.

Copies of established and recorded land usage restrictions are available at the Town of Coventry Land Records.

#### 6.5 Data Review

Data is regularly collected in accordance with the Compliance Monitoring Plan, O&M Plan, and other workplans generated in accordance with the Statement of Work. Data is reported in Monthly, Quarterly, and Semi-Annual reports. System performance and compliance is summarized in Semi-Annual Remedy Progress Monitoring Reports.

#### **Target Dewatering Evaluation**

The following summarizes the most recent assessment on the achievement of target dewatering elevations (TDE) within the source area.

- 1. The dewatering design criteria have been consistently achieved in the West Trench.
- The dewatering design criteria have consistently been achieved across most of the Northeast
  Trench area except in one location where deeper soil impacts were discovered during
  construction that required the lowering of dewatering requirements in this area and which have
  not yet been met.
- 3. The dewatering design criteria have consistently been achieved across a portion of the Northwest Trench where the design calls for dewatering to the top of competent bedrock. In other areas, with close proximity of TDEs relative to the lower yielding weathered and competent bedrock, TDEs have not been achieved.
- 4. Installing new pumping wells in the Northeast and Northwest trenches in the Fall 2002 does not appear to be helping to achieve TDEs in their immediate vicinities due to the heterogeneity of

the subsurface and, in the Northwest Trench, the close proximity of TDEs in the area to the lower yielding competent and weathered bedrock.

#### Hydraulic Containment Assessment

The system performance was evaluated to determine whether the groundwater extraction program achieves hydraulic control of the 1 ppm TVOC plume, thereby isolating the source area groundwater plume from the dilute groundwater plume. Results of this evaluation are summarized below.

- Observations from the groundwater contour maps and groundwater modeling continue to indicate that the extraction system has generally maintained hydraulic containment of the 1 ppm TVOC plume laterally in the Northwest Plume. The extent of containment downgradient towards the Unnamed Swamp is less certain due to the difficulty in definitively establishing stagnation points.
- 2. In the Southwest Plume, hydraulic containment of the lateral extent of the 1 ppm TVOC plume is less well documented than for the Northwest Plume. This limitation is partially due to the smaller size of the Southwest Plume and the conservative nature used to delineate the plume. The assessment does indicate, however, that the pumping well contains groundwater flowing through this source area.
- 3. The vertical gradient evaluations suggest that vertical containment is being achieved in both the Northwest and Southwest plume areas.

#### VOC Reduction in the Dilute Plume Area

Initial evaluations of natural attenuation within fringes of the plume have been performed . Since the OU 2 remedy has been active for only 22 months, no formal monitored natural attenuation (MNA) program has been implemented and it is too early to draw conclusions on the rates and effectiveness of the MNA at this time.

#### Groundwater Treatment System Discharges

The standard for determining groundwater treatment compliance is the Surface Water Discharge Criteria (SWDC) established in accordance with applicable RIDEM regulations. The groundwater treatment system has been effective at meeting the applicable SWDC for all organic constituents, including VOCs, SVOCs, pesticides and PCBs. The groundwater treatment system has been effective at meeting the applicable SWDC for all inorganic constituents of concern with the exception of aluminum, copper, and zinc. None of these exceedances represented significant noncompliance. Corrective measures including system cleaning and peroxide destruction unit (PDU) media replacement have routinely lead to improved inorganic SWDC compliance.

#### SVE Vapor Treatment System Performance

Combined treatment system vapor emission (SVE system and groundwater system off gas controls) compliance limits are established by the State of Rhode Island Department of Environmental Management (RIDEM) Air Pollution Regulation (APCR) 22. The 1993 Record of Decision for the Site identified APCR 22 as an Action Specific ARAR. The results of the initial ARAR emission testing

conducted on November 27, 2001 suggested an exceedance of the annual standard for PCE. Additional monthly sampling conducted on the combined treatment system exhaust shows a decline in the discharge concentration to levels well below the applicable maximum allowable stack concentration (MASC). The combined treatment system annual average effluent concentration, based on monthly sampling results, was 1,943  $\mu$ g/M³, which was below the applicable annual MASC of 3,860  $\mu$ g/M³ for PCE.

The second ARAR compliance air-sampling event was completed on February 20, 2003. The results of that sampling events are not yet available.

#### Surface Water and Sediment Monitoring

Periodic surface water and sediment testing are being conducted at the Site. Latest sampling was done during the Spring 2001. These results indicate that:

- Concentrations of VOCs and SVOCs detected in surface water and sediment at previously established sampling locations are within the range of sampling events from 1991 to 2001, and concentrations are declining with distance from the Site.
- VOCs and SVOCs are generally not detected in surface water samples or are detected at
  concentrations below the surface water cleanup criteria. Two samples collected from on-Site
  upland groundwater seep locations exceeded the Site-specific surface water cleanup criteria for
  VOCs in surface water.
- Results of sediment sampling within Unnamed Swamp indicate concentrations of VOCs and SVOCs for the most part of the same compounds as detected in groundwater. Migration pathways for historical depositions may have had multiple modes, but currently groundwater is the likely pathway.

#### 7.0 TECHNICAL ASSESMENT OF REMEDY

#### 7.1 Question A:

#### Is the remedy functioning as intended by the decision documents?

OU1 - Yes

OU2 - Remedy performance evaluations indicate that the remedy is functioning as designed. These evaluations to date have focused on VOC mass removal and hydraulic containment. It is too early to evaluate whether the overall ROD's primary objective of addressing the remaining principal threats to human health and the environment posed by remediating residual soil contaminants as a potential continuing source for leaching of contaminants to Site groundwater is being met. Physical monitoring of system performance and contaminant mass removed indicate that the remedy is functioning properly. The following summarizes the information supporting this evaluation. The determination that the system performance standards have been met and that the system is operational and functional is currently pending.

Source Area - Monitoring to date indicates that the source area remedy (dewatering and SVE) is

generally operating and functioning as designed. Monitoring has been initiated to demonstrate compliance with the source remedy closure criteria in the West Trench.

The dewatering portion of the remedy is generally functioning as intended by the decision documents, but TDEs have not been achieved in all areas. The PRPs have taken steps to improve dewatering including the installation of two new dewatering wells in the Fall 2002. The PRPs are currently planning additional efforts to improve dewatering in those areas where achievement of TDEs is inconsistent or have not yet been achieved.

SVE airflow design parameters have been achieved across the majority of the SVE implementation area. Starting in 2003, the PRP Group has reconfigured the SVE system to allow passive and active air injection. This will allow for the same airflow through the soil, but at a lower vacuum.

VOC and SVOC mass removal from soil and groundwater further demonstrates the functioning of the source control remedy. To date, approximately 21, 425 pounds of VOCs have been recovered from the source area and destroyed by the SVE and groundwater treatment system. In addition, biological activity is estimated to have destroyed 36,500 to 42,000 pounds of contaminants.

Figure 3, SVE System Mass Removal Via Volatilization and Influent TVOCs Vs. Time, presents the SVE system influent TVOCs and SVE system cumulative mass removed via volatilization versus time. As shown, the vast majority of VOC mass removal via volatilization occurred within the first two months of project operation. VOC mass removal rates have dropped significantly since mid-February 2002. Figure 4 – Total VOC and SVOC Influent Concentrations, shows how influent contaminant levels have decreased over time.

<u>MOM</u> – Preliminary monitoring indicates that hydraulic control has been generally achieved within the Site imposed limits. Monitoring and evaluation will continue.

<u>Dilute Plume</u> -It is too early to draw conclusions on the rates and effectiveness of the natural attenuation at this time. Evaluation of natural attenuation will be included in future reports.

<u>Institutional Controls</u> – Institutional controls have not been fully established on all required properties. Site access controls have been fully implemented and are maintained, and based upon the nature and extent of contamination and current land uses, sufficient institutional controls are in place to prevent human exposure in the near term until agreements are reached with the remaining landowners so that all such controls are achieved.

<u>Residual Soil PCB Removal</u> – The removal of the PCB-impacted shallow soil has been completed and documented to have met ROD requirements.

#### System O&M and Costs

Current maintenance procedures will continue to ensure the effectiveness of response actions. System operational time has been high for both the groundwater and SVE systems, running 94% and 84% of the time respectively since starting full-scale operation. A number of system shut downs have been associated with erratic electrical supply (brownouts and power interruptions).

System monitoring is continuously performed and the data used to adjust system-operating parameters. Environmental data are collected in accordance with the Compliance Monitoring Plan to evaluate remedy effectiveness. Both are adequate.

O&M costs are higher than those originally estimated in the ROD. If the mass of contaminants removed over time decreases without an appreciable reduction in costs, an aggressive system optimization may be warranted.

#### Opportunities for Optimization

Largely in response to declining mass removal rates the following opportunities for treatment system optimization have been identified:

- Analytical and labor costs associated with groundwater treatment effluent monitoring could be lowered by reducing monitoring frequency and/or the number of parameters to be monitored.
- Groundwater UV/OX operation could be discontinued as VOC concentrations decrease.
   Existing air stripper or new liquid phase carbon units could be utilized.
- As air VOC concentrations decline, the CAT/OX system could be replaced with vapor phase carbon units.

#### 7.2 Question B:

Are the exposure assumptions, toxicity data, cleanup levels, and remedial objectives (RAOs) used at the time of the remedy selection still valid?

OU1 - Yes.

OU2 - There have been no changes in the Site setting and surrounding land use which would affect exposure assumptions and Remedial Action Objectives (RAOs) developed in the 1993 ROD.

It is too early to determine if the overall remedy will progress as expected in the 1993 ROD. The aquifer under the Site is a potential source of drinking water, therefore, MCLs and non-zero MCLGs are ARARs in the 1993 ROD. Soil cleanup levels were established to protect the aquifer from the potential leaching of contaminants into the groundwater. Ambient Water Quality Criteria (AWQCs) are also ARARs for surface water bodies near the Site. The ROD anticipated three years of source control (dewatering and SVE) operation, and 20 years to meet the groundwater cleanup levels. It is not clear at this time if remediation goals will be met within this period. The ROD acknowledged that the ability to meet this timeframe would be dependent on a number of factors associated with subsurface conditions and the remedy performance.

#### Surface Water Discharge Criteria

Surface water discharge criteria (SWDC) for the treatment system are generally based on ambient water quality criteria established in the RIDEM Water Quality Regulations (August 26, 1997). However, Site specific SWDC were established for the six compounds listed in the following table. These Site specific

SWDC were established to reflect laboratory Method Detection Limits (MDL) and were approved in a June 18, 1999, RIDEM letter. The RIDEM agreed that the MDLs were sufficiently close to the established SWDC for each of the compounds listed below. The Table shows the SWDC for Class A water bodies presented in the Water Quality Regulations, the current Site-specific SWDC and the associated ROD surface water cleanup levels.

**RIDEM Water Quality** Site Specific **ROD Surface** Compound Regulations SWDC (ug/L) SWDC Water Cleanup (ug/l) Level (ug/l) 1,1,2,2-Tetrachloroethane 1.7 2.0 None Bis(2-Chloroethyl)ether 0.31 1.0 None 2.0 Pentachlorophenol\* 0.13 None Methoxychlor 0.12 None 0.1 Thallium 1.7 1.2 None Vanadium 2 None None

Table 3
Site Specific Surface Water Discharge Criteria

The bases for two of the SWDC have changed. The 1993 ROD set the human health risk based cleanup level for manganese at 180 ug/l. The manganese reference dose (RfD) in the IRIS database was revised in November 1995. This revision resulted in a lower risk (and thus, higher allowable levels) compared to the previous RfD. A hazard index (HI) of 1 under drinking water exposures corresponds to a concentration of 840 ug/l and was used to establish the allowable SWDC for the system discharge.

The 1993 ROD also set the aluminum cleanup level at 748 ug/l based on Federal AWQC, based on published ecotoxicological data of 1,490/748 ug/l (acute/chronic). Subsequently, the national AWQC for aluminum was revised to be 750/87 ug/l (acute/chronic) and was adopted by Rhode Island (August 6, 1997, RIDEM Water Quality Regulations (Appendix B, Table 1)). The new chronic concentration of 87 ug/l was used to establish the allowable SWDC for the system discharge and appropriate system modifications were made to achieve this level.

It is premature at this time to decide whether these revised levels need to be adopted as protective cleanup levels for surface water and ground water. It is recommended that adoption of appropriate protectiveness levels be evaluated in decision documents to be developed when effectiveness of the remedy to achieve the overall remediation objectives is evaluated.

#### 7.3 Question C:

## Has any other information come to light that could call into question the protectiveness of the remedy?

OU1 and OU2 - No other information has been discovered that would adversely affect the protectiveness of the remedy.

<sup>\*</sup> Using default hardness of 25 mg/l as CaCO<sub>3</sub> and values from Table 2 Appendix B, RIDEM Ambient Water Quality Criteria and Guidelines for Toxic Pollutants (August 6, 1997)

#### 7.4 Technical Assessment Summary

According to the data reviewed, the Site inspection, and the interviews, the treatment system is essentially at the operational and functional level. The formal operational and functional determination under the required Remedial Action Report is currently pending. Portions of the remediation extraction system must operate longer to confirm that the ROD objectives are met. There have been no changes in the physical conditions of the Site except for the removal of the epoxy waste which is expected to improve the protectiveness of the remedy.

#### 8.0 ISSUES

OU1 - None

OU2 - Based upon the above the following issues were identified that might impact the ability of the remedy to be protective in the long-term or serve as early indicators of potential remedy problems.

Table 4
Issues Identified

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
Ability to achieve target dewatering elevations (TDE)	`No´	`No*´
Ability to place all required Institutional Controls	No	Yes
Confirming that SVE air treatment system is meeting discharge requirements	Yes	No
Confirming that corrective actions taken to address groundwater mounding due to SVE are effective.	No	No*
Confirming that MOM hydraulic containment is achievable.	No	No*
Increasing contaminants of concern observed in the northwest portion of the Dilute Plume	No	No*

<sup>\*</sup> It is premature to determine if these issues will affect future protectiveness of the remedy.

#### 9.0 RECOMMENDATIONS AND FOLLOW-UP ACTIONS

For each issue identified, the following table documents recommended follow-up actions.

Table 5
Recommendations and Follow-Up Actions

Issue	Recommendations/ Follow-Up Actions	Party Responsible	Oversight Agency	Milestone Date	Follow-Up Affects Prot (Y/I Current	ectiveness
Ability to achieve target dewatering elevations (TDE)	<ul> <li>Evaluate dewatering effectiveness in the Northeast Trench after installation of additional well during the summer of 2003.</li> <li>Evaluate ability of the system to consistently meet TDEs in Northwest Trench.</li> </ul>	PRP Group	EPA/RIDEM	2/28/04	No	No*
Ability to place all required Institutional Controls	If requested, EPA to facilitate placement of final Institutional Controls.	PRP Group	EPA/RIDEM	2/28/04	No	Yes
Confirming that SVE air treatment system is meeting discharge requirements	Review ARAR air emissions data to confirm requirements are being met; if not met - implement corrective action	PRP Group	EPA/RIDEM	2/28/04	Yes	No
Confirming that corrective actions taken to address groundwater mounding due to SVE are effective.	Continue to implement modified water level measurement techniques. Use passive and active air injection in most problematic areas. Evaluate SVE performance.	PRP Group	EPA/RIDEM	2/28/04	No	No*
Confirming that MOM hydraulic containment is achievable.	Evaluate flow conditions using flow nets, modify operations if necessary.	PRP Group	EPA/RIDEM	2/28/04	No	No*
Increasing contaminants of concern observed in the northwest portion of the Dilute Plume	Collect additional data to assess the increasing concentration trends observed at a portion of the Northwest Plume. Evaluate impact of the operation of nearby pumping wells on the hydraulics in the vicinity of these wells and affect on the concentration trends in this area.	PRP Group	EPA/RIDEM	2/28/04	No	No*

<sup>\*</sup> It is premature to determine if these issues will affect future protectiveness of the remedy.

#### 10.0 PROTECTIVENESS STATEMENT

OU1 involved the excavation and off-Site disposal of stockpiled soil that was completed in 1989. Residual PCB impacted surficial soil associated with these stockpiles was removed by EPA as part of OU2 in 1998. Based upon these actions, the remedy for OU1 is expected to be or is protective of human health and the environment, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

OU2 protects human health in the short-term through implementation of various response actions, the partial placement of Institutional Controls, and the physical control of Site access. The 1993 ROD determined that the response actions that are in the process of being implemented would be protective in the long term to human health and the environment. The remedy at OU2 is expected to be protective of human health and the environment upon completion, and in the interim, exposure pathways that could result in unacceptable risks are being controlled.

#### 11.0 NEXT REVIEW

The next five-year review for the Picillo Farm Superfund Site is required by September 2008, five years from the date of this review.

#### 12.0 REFERENCES

Compliance Monitoring Plan, Environmental Science Services, Inc, March 7, 2002 as revised through November 2002.

Comprehensive Five-year Review Guidance, U.S. EPA, OERR, June 2001

Construction Completion Report, Envirogen, March 29, 2000.

Draft 30 Percent Design Report, HSI GeoTrans, September 16, 1997.

Draft 60% Design Report, Envirogen/Woodward-Clyde, March 2, 1998

Final 100% Design Report, Envirogen/Woodward-Clyde, October 5, 1998.

Draft Final Work Plan, Picillo Waste Removal Action, Environmental Science Services, Inc., March 12, 2003.

Draft Institutional Controls Plan, Environmental Project Control, March 20, 2001.

Draft Semi-Annual Remedy Progress Monitoring Report, Environmental Science Services, Inc., September 20, 2002.

Draft Spring 2001 Surface Water and Sediment Sampling Event Report, Environmental Science Services, Inc., April 1, 2002.

Draft Third Semi-Annual Remedy Progress Monitoring Report, ESS Group, Inc., May 29, 2003.

Draft Work Plan, Picillo Waste Removal Action, Environmental Science Services, Inc., December 24, 2002.

Final Remedial Action Report, Contaminated Soil Removal, Roy F. Weston, Inc., May 12, 1999

Five Year Review, Picillo Farm Superfund Site, U.S. EPA, May 1998.

Five Year Review, Source Control Remedy, U.S. EPA, May 1993.

Operation and Maintenance Plan, Envirogen, May 12, 2000 as revised by Environmental Science Services, Inc. through March 2002.

Remedial Design Work Plan & Project Operations Plan, GeoTrans, Inc., January 10, 1996.

Revised Draft Remedial Action Work Plan, Envirogen, January 18, 1999.

Revised Startup Program Work Plan, Environmental Science Services, Inc., March 20, 2000, as revised March 28, 2001.

United States Environmental Protection Agency Administrative Order on Consent. US EPA Region 1 CERCLA Docket No. 01-2003-0007.

United States Environmental Protection Agency, Decision Document, Preauthorization of a CERCLA Section 111(a) Claim. Signed by Region 1, Regional Administrator, November 13, 2002.

United States Environmental Protection Agency RD/RA Consent Decree. Signed by Region 1, Regional Administrator October 25, 1995 and entered by the Court on October 9, 1997.

#### 13.0 LIST OF ACRONYMS

ACOE Army Corps of Engineers

AOC Administrative Order on Consent

ARARs Applicable or Relevant and Appropriate Requirements

AWQC Ambient Water Quality Criteria

CAT/OX Catalytic Oxidation
CD Consent Decree

CERCLA Comprehensive Environmental Response, Compensation, and Liability Act

CMP Compliance Monitoring Plan

ELUR Environmental Land Use Restriction
EPA US Environmental Protection Agency

EW Extraction Well
FS Feasibility Study
HCI Hydrochloric Acid
HI Hazard Index

IAG Interagency Agreement
ICP Institutional Controls Plan
IC(s) Institutional Control(s)
MW Monitoring Well

MCL(s) Maximum Contaminant Level(s)
MCLG(s) Maximum Contaminant Level Goal(s)

MNA Monitored Natural Attenuation NCP National Contingency Plan

MASC Maximum Allowable Stack Concentration

MDL Method Detection Limit mg/L Milligrams per Liter

μg/M³
 Micrograms per Cubic Meter
 MOM
 Management of Migration
 NPL
 National Priorities List
 O&M
 Operation and Maintenance

OU(s) Operable Unit(s)

PCBs Polychlorinated Biphenyls

PCE Tetrachloroethene

PDU Peroxide Destruction Unit

ppb Parts per Billion ppm Parts per Million

PRPs Potentially Responsible Parties

RA Remedial Action

RAOs Remedial Action Objectives

RCRA Resource Conservation and Recovery Act

RD/RA Remedial Design/Remedial Action

RI Remedial Investigation

RI Rhode Island

RIDEM Rhode Island Department of Environmental Management

RI/FS Remedial Investigation/Feasibility Study
RI WQR Rhode Island Water Quality Regulations

ROD Record of Decision

RPM Remedial Project Manager Site Picillo Farm Superfund Site

SOW Statement of Work
SVE Soil Vapor Extraction

SWDC Surface Water Discharge Criteria SVOCs Semi-Volatile Organic Compounds

TDE Target Dewatering Depth

TVOC Total Volatile Organic Compounds

ug/L Micrograms per Liter

VOCs Volatile Organic Compounds

PICILLO FARM SUPERFUND SITE Coventry, Rhode Island

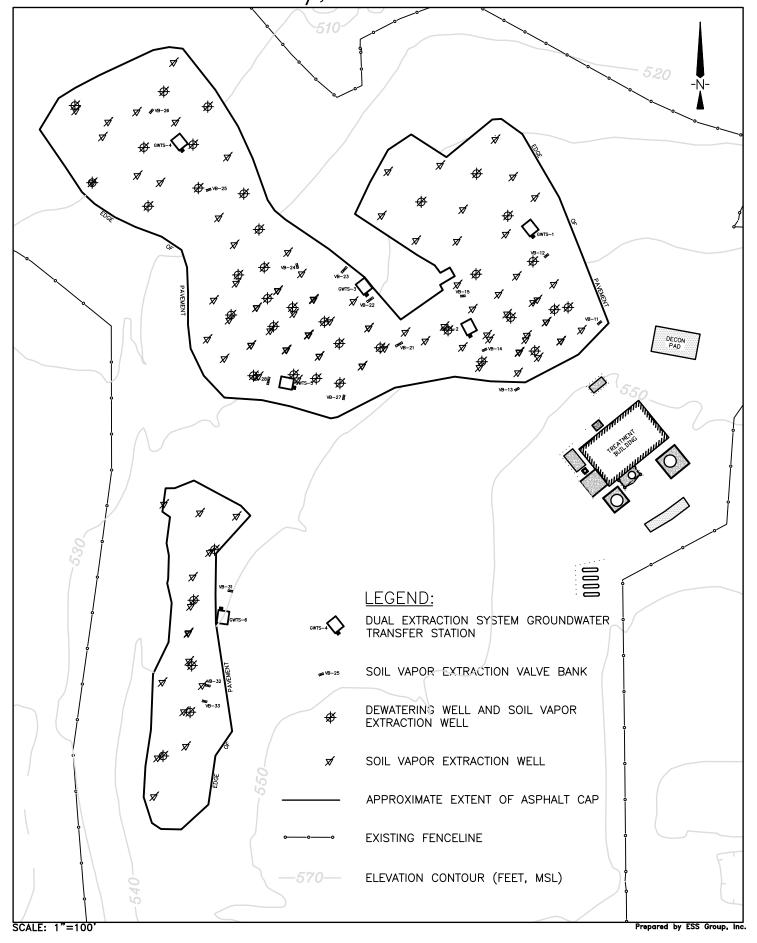


Figure 3
SVE System Mass Removal Via Volatilization and Influent TVOCs Vs. Time
Picillo Farm Superfund Site
Coventry, Rhode Island

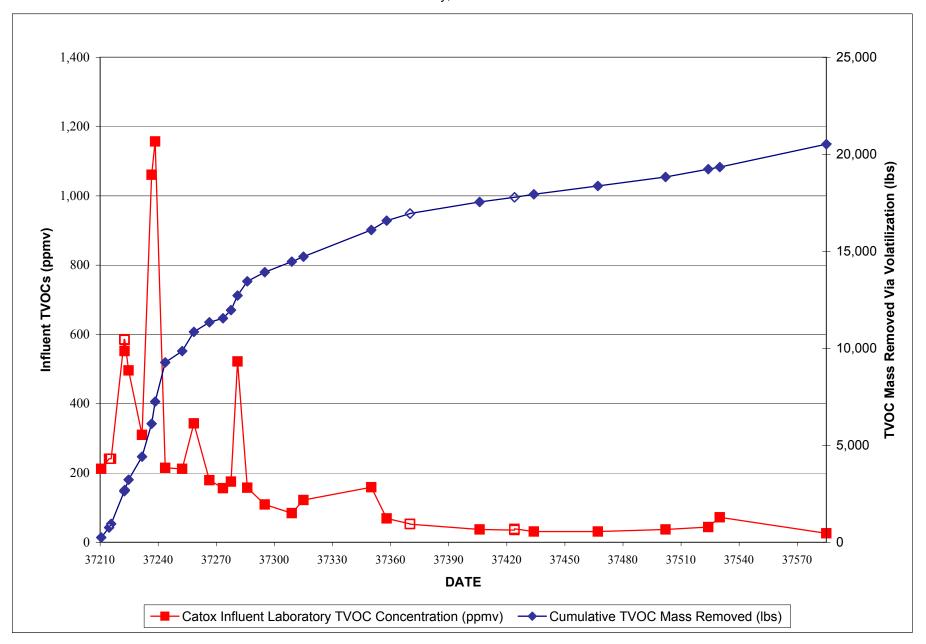


Figure 4
Total VOC and SVOC Groundwater Influent Concentrations
Picillo Farm Superfund Site
Coventry, Rhode Island

